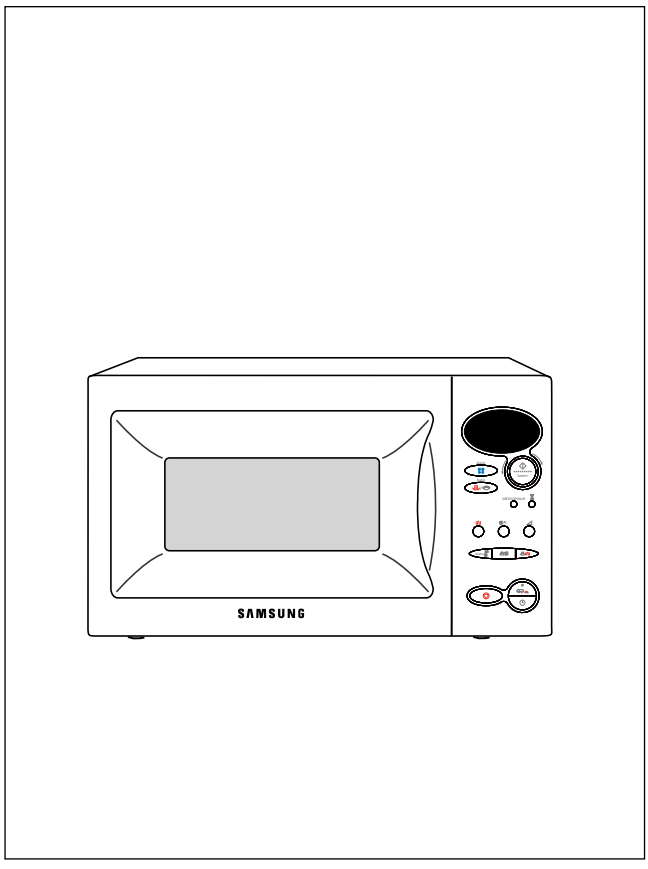
SAMSUNG

MICROWAVE OVEN

CK135 (WHITE)

SERVICE Manual

MICROWAVE OVEN



CONTENTS

1. Precaution

2. Specifications

3. Operating Instructions

4. Disassembly and Reassembly

5. Alignment and Adjustments

6. Troubleshooting

7. Exploded Views and Parts List

8. PCB Diagrams

9. Schematic Diagrams

PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TOAVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

(a) Do not operate or allow the oven to be operated with the door open.

(b) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary:
  (1) Interlock operation,
  (2) proper door closing,
  (3) seal and sealing surfaces (arcing, wear, and other damage),
  (4) damage to or loosening of hinges and latches,
  (5) evidence of dropping or abuse.

(c) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, wave guide or transmission line, and cavity for proper alignment, integrity, and connections.

(d) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.

(e) A Microwave leakage check to verify compliance with the Federal performance standard should be performed on each oven prior to release to the owner.

1. Precaution

Follow these special safety precautions. Although the microwave oven is completely safe during ordinary use, repair work can be extremely hazardous due to possible exposure to microwave radiation, as well as potentially lethal high voltages and currents.

1-1 Safety precautions (⚠)

1. All repairs should be done in accordance with the procedures described in this manual. This product complies with Federal Performance Standard 21 CFR Subchapter J (DHHS).

2. Microwave emission check should be performed to prior to servicing if the oven is operative.

3. If the oven operates with the door open : Instruct the user not to operate the oven and contact the manufacturer and the center for devices and radiological health immediatly.

4. Notify the Central Service Center if the microwave leakage exceeds 5 mW/cm^2

5. Check all grounds.

6. Do not power the MWO from a "2-prong" AC cord. Be sure that all of the built-in protective devices are replaced. Restore any missing protective shields.

7. When reinstalling the chassis and its assemblies, be sure to restore all protective devices, including: nonmetallic control knobs and compartment covers.

8. Make sure that there are no cabinet openings through which people--particularly children--might insert objects and contact dangerous voltages. Examples: Lamp hole, ventilation slots.

9. Inform the manufacturer of any oven found to have emmission in excess of 5 mW/cm^2, Make repairs to bring the unit into compliance at no cost to owner and try to determine cause.
   Instruct owner not to use oven until it has been brought into compliance.

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10. Service technicians should remove their watches while repairing an MWO.

11. To avoid any possible radiation hazard, replace parts in accordance with the wiring diagram. Also, use only the exact replacements for the following parts: Primary and secondary interlock switches, interlock monitor switch.

12. If the fuse is blown by the Interlock Monitor Switch: Replace all of the following at the same time: Primary, door sensing switch and power relay, as well as the Interlock Monitor Switch. The correct adjustment of these switches is described elsewhere in this manual. Make sure that the fuse has the correct rating for the particular model being repaired.

13. Design Alteration Warning:
    Use exact replacement parts only, i.e., only those that are specified in the drawings and parts lists of this manual. This is especially important for the Interlock switches, described above. Never alter or add to the mechanical or electrical design of the MWO. Any design changes or additions will void the manufacturer's warranty.10.Always unplug the unit's AC power cord from the AC power source before attempting to remove or reinstall any component or assembly.

14. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.

15. Some semiconductor ("solid state") devices are easily damaged by static electricity. Such components are called Electrostatically Sensitive Devices (ESDs). Examples include integrated circuits and field-effect transistors.

    Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground.

16. Always connect a test instrument's ground lead to the instrument chassis ground *before* connecting the positive lead; always remove the instrument's ground lead last.

1-2 Special Servicing Precautions (Continued)

17. When checking the continuity of the witches or transformer, always make sure that the power is OFF, and one of the lead wires is disconnected.

18. Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safetycharacteristics as the original might create shock, fire or other hazards.

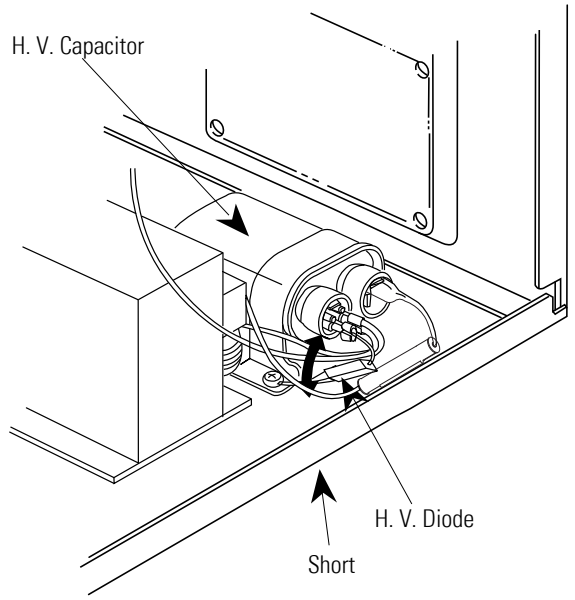
1-3 Special High Voltage Precautions

1. High Voltage Warning
   Do not attempt to measureany of the high voltages--this includes the filament voltage of the magnetron. High voltage is present during any cook cycle.

   Before touching any components or wiring, always unplug the oven and discharge the high voltage capacitor (See Figure 1-1)

2. The high-voltage capacitor remains charged about 30 seconds after disconnection. Short the negative terminal of the high-voltage capacitor to to the oven chassis. (Use a screwdriver.)

3. High voltage is maintained within specified limits by close-tolerance, safety-related components and adjustments. If the high voltage exceeds the specified limits, check each of the special components.



⚠ Touch chassis ground first then short to the high voltage capacitor terminal by using screwdriver or jumper wire.

Fig. 1-1. Discharging the High Voltage Capacitor

PRECAUTION

There exists HIGH VOLTAGE ELECTRICITY with high current capabilities in the circuits of the HIGH VOLTAGE TRANSFORMER secondary and filament terminals. It is extremely dangerous to work on or near these circuits with the oven energized.
DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

PRECAUTION

Never touch any circuit wiring with your hand nor with uninsulated tool during operation.

PRECAUTION

Servicemen should remove their watches whenever working close to or replacing the magnetron.

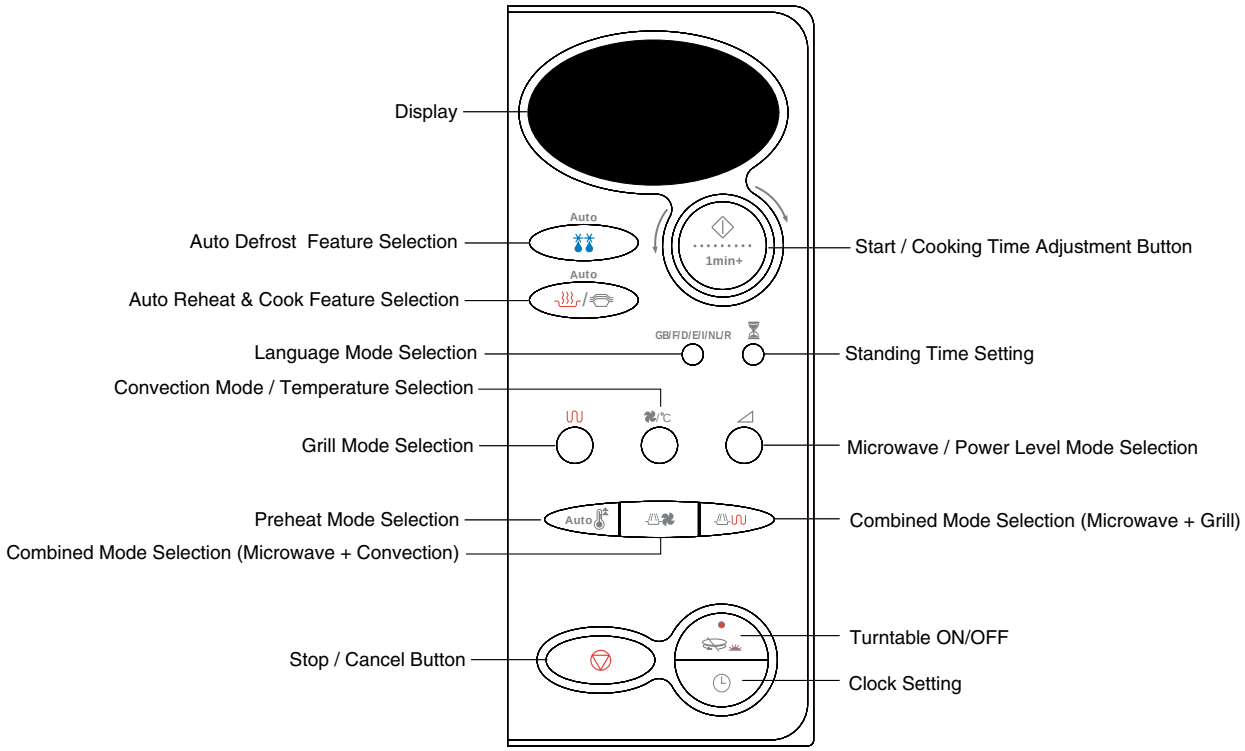
2. Specifications

2-1 Table of Specifications

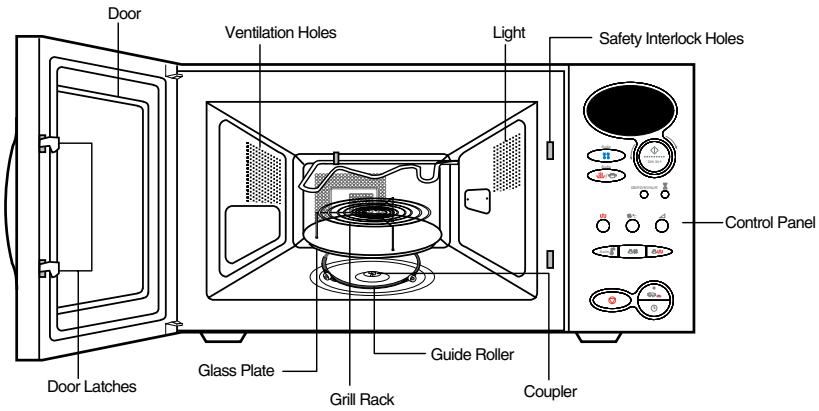
ITEM \ MODEL	CK135
TIMER	99 MINUTES
POWER SOURCE	230V/50HZ, AC
POWER CONSUMPTION	MICROWAVE : 1,500W,GRILL : 1,300W, CONVECTION : 1700W
OUTPUT POWER	FROM 100 TO 900W (6 LEVEL POWER)
	(IEC-705 TEST PROCEDURE)
OPERATING FREQUENCY	2,450MHz
MAGNETRON	OM75PH(31)
COOLING METHOD	COOLING FAN MOTOR
OUTSIDE DIMENSIONS	625(W) x 390(H) x 575(D)
NET WEIGHT	26 Kg
SHIPPING WEIGHT	28 Kg

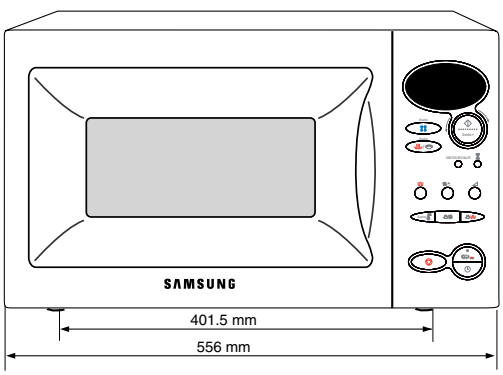
3. Operating Instructions

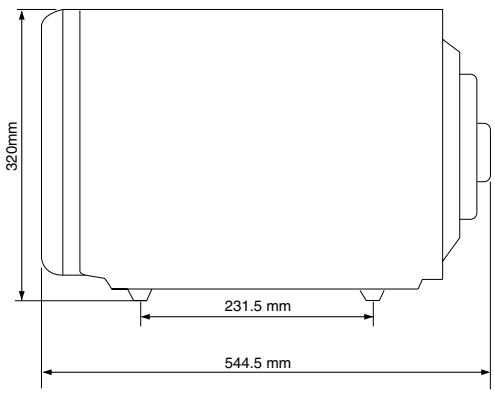
3-1 Control Panel



3-2 Features & External Views







4. Disassembly and Reassembly

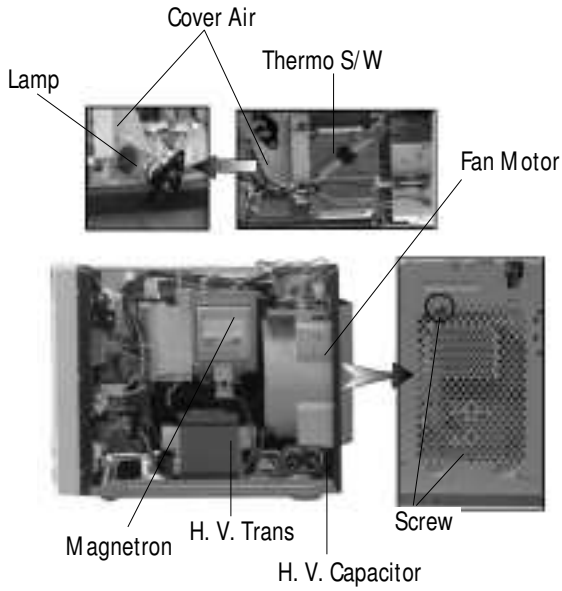
4-1 Replacement of Magnetron, Motor Assembly and Lamp

Remove the magnetron including the shield case, permanent magnet, choke coils and capacitors (all of which are contained in one assembly).

1. Disconnect all lead wires from the magnetron and lamp.
2. Remove the bracket mounting.
3. Remove the magnetron supporter
4. Remove the air cover.
5. Remove screws securing the magnetron to the wave guide.
6. Take out the magnetron very carefully.
7. Remove screws from the back panel.
8. Remove the assy noise filter.
9. Take out the fan motor.
10. Remove the oven lamp by pulling out from hole of air cover carefully.

NOTE1: When removing the magnetron, make sure that its antenna does not hit any adjacent parts, or it may be damaged.

NOTE2: When replacing the magnetron, be sure to remount the magnetron gasket in the correct position and make sure the gasket is in good condition.



4-2 Replacement of High Voltage Transformer

1. Discharge the high voltage capacitor.
2. Disconnect all the leads.
3. Remove the mounting bolts.
4. Reconnect the leads correctly and firmly.

PRECAUTION

Servicemen should remov their watches whenever working close to or replacing the magnetron.

PRECAUTION

There exists HIGH VOLTAGE ELECTRICITY with high current capabilities in the circuits of the HIGH VOLTAGE TRANSFORMER secondary and filament terminals. It is extremely dangerous to work on or near these circuits with the oven energized.
DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

- MEMO -

4-3-6 Reassembly Test

After replacement of the defective component parts of the door, reassemble it and follow the instructions below for proper installation and adjustment so as to prevent an excessive microwave leakage.

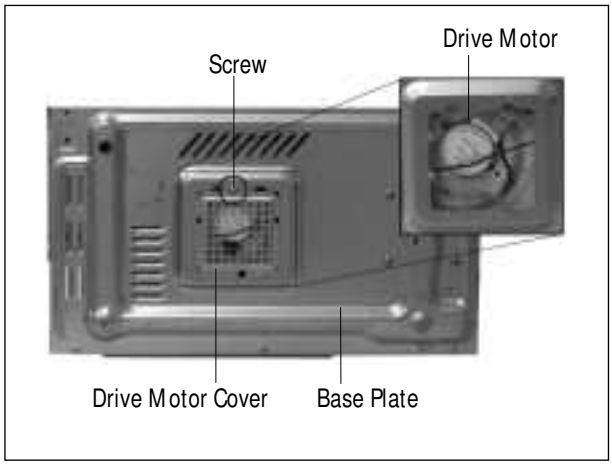
1. When mounting the door to the oven, be sure to adjust the door parallel to the bottom line of the oven face plate by moving the upper hinge and lower hinge in the direction necessary for proper alignment.
2. Adjust so that the door has no play between the inner door surface and oven front surface. If the door assembly is not mounted properly, microwave energy may leak from the space between the door and oven.
3. Do the microwave leakage test.

4-4 Replacement of Fuse

1. Disconnect the oven from the power source.
2. When 15A fuse blows out by the operation of interlock monitor switch failure, replace the primary interlock switch, door sensing switch, monitor switch and power relay.
3. When the above three switches operate properly, check if any other part such as the control circuit board, blower motor or high voltage transformer is defective.

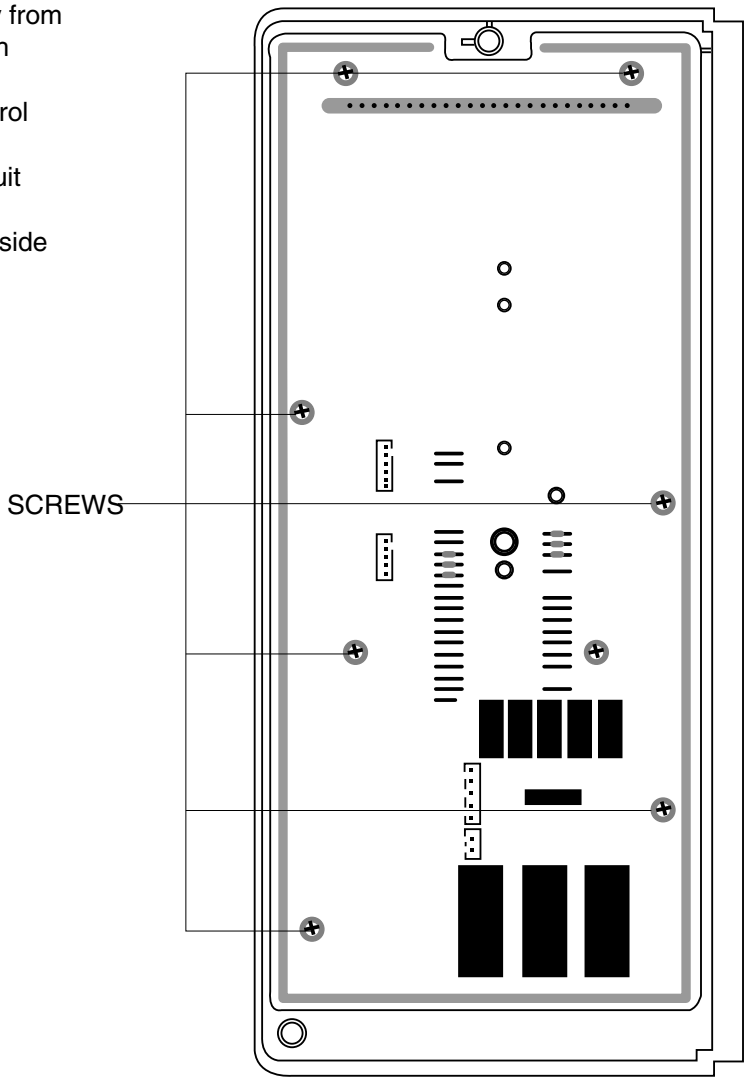
4-5 Replacement of Drive Motor

1. Take out the glass tray and guide roller from the cavity.
2. Turn the oven upside down to replace the drive motor.
3. Remove a screw securing the drive motor cover.
4. Disconnect all the lead wires from the drive motor.
5. Remove screws securing the drive motor to the cavity.
6. Remove the drive motor and coupler.
7. When replacing the drive motor, be sure to remount it in the correct position with the coupler.
8. Connect all the leads to the drive motor.
9. Screw the drive motor cover to the base plate with a screw driver.



4-6 Replacement of Control Circuit Board

1. Be sure to disclyarge any static electricity from your body, and avoid touching the "Touch control" clrcuitry.
2. Disconnect the connectors from the control circuit board.
3. Remove screws securing the control circuit bord.
4. Lift up the control circuit board from right side and remove the hooks holding the contol circuit board to the box assembly.



5. Alignment and Adjustments

PRECAUTION

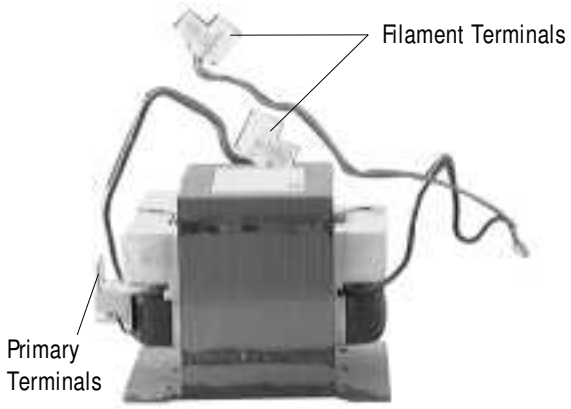
1. High voltage is present at the high voltage terminals during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components or wiring, always unplug the oven from its power source and discharge the high voltage capacitor.

5-1 High Voltage Transformer

1. Remove connectors from the transformer terminals and check continuity.
2. Normal resistance readings are as follows:

Secondary	98.6Ω ± 10%
Filament	Shows Continuity
Primary	1.44Ω ± 10%

(Room temperature = 20˚C)



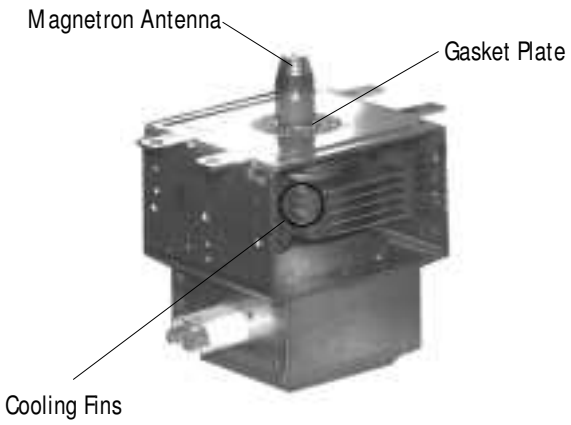
5-2 Low Voltage Transformer

1. The low voltage transformer is located on the control circuit board.
2. Remove the low voltage transformer from the PCB Ass'y and check continuity.
3. Normal resistor reading is shown in the table.

Terminals	Resistance
1~2(Input)	290Ω
3~4(Output)	4.0Ω
5~6(Output)	1.0Ω

5-3 Magnetron

1. Continuity checks can indicate only an open filament or a shorted magnetron. To diagnose an open filament or shorted magnetron :
2. Isolate the magnetron from the circuit by disconnecting its leads.
3. A continuity check across the magnetron filament terminals should indicate one ohm or less.
4. A continuity check between each filament terminal and magnetron case should read open.



5-4 High Voltage Capacitor

1. Check continuity of the capacitor with the meter set at the highest resistance scale.
2. Once the capacitor is charged, a normal capacitor shows continuity for a short time, and then indicates 9MΩ.
3. A shorted capacitor will show continuous continuity.
4. An open capacitor will show constant 9MΩ.
5. Resistance between each terminal and chassis should read infinite.

5-5 High Voltage Diode

1. Isolate the diode from the circuit by disconnecting its leads.
2. With the ohm-meter set at the highest resistance scale, measure across the diode terminals. Reverse the meter leads and read the resistance. A meter with 6V, 9V or higher voltage batteries should be used to check the front-to back resistance of the diode (otherwise an infinite resistance may be read in both directions). The resistance of a normal diode will be infinite in one direction and several hundred KΩ in the other direction.

5-6 Main Relay and Power Control Relay

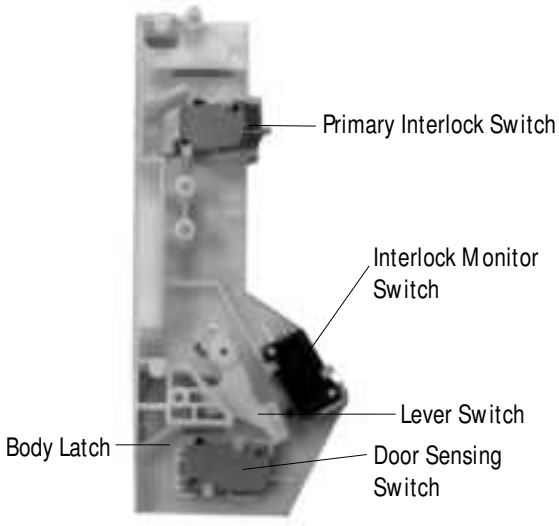
1. The relays are located on the PCB Ass'y. Isolate them from the main circuit by disconnecting the leads.
2. Operate the microwave oven with a water load in the oven. Set the power level set to high.
3. Check continuity between terminals of the relays after the start pad is pressed.

5-7 Adjustment of Primary Switch, Door Sensing Switch and Monitor Switch

Precaution

For continued protection against radiation hazard, replace parts in accordance with the wiring diagram and be sure to use the correct part number for the following switches: Primary and door sensing switches, and the interlock monitor switch (replace all together). Then follow the adjustment procedures below. After repair and adjustment, be sure to check the continuity of all interlock switches and the interlock monitor switch.

1. When mounting Primary switch and Interlock Monitor switch to Latch Body, consult the figure.
2. No specific adjustment during installation of Primary switch and Monitor switch to the latch body is necessary.
3. When mounting the Latch Body to the oven assembly, adjust the Latch Body by moving it so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the Latch Body to the oven assembly.
4. Reconnect to Monitor switch and check the continuity of the monitor circuit and all latch switches again by following the components test procedures.
5. Confirm that the gap between the switch housing and the switch actuator is no more than 0.5mm when door is closed.



	Door Open	Door Closed
Primary switch	∞	0
Monitor switch (COM-NC)	0	∞
Door Sensing S/W	∞	0

5-8 Output Power of Magnetron

CAUTION
MICROWAVE RADIATION

PERSONNEL SHOULD NOT ALLOW EXPOSURE TO MICROWAVE RADIATION FROM MICROWAVE GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

The output power of the magnetron can be measured by performing a water temperature rise test.

Equipment needed :

* Two 1-liter cylindrical borosilicate glass vessel (Outside diameter 190 mm)
* One glass thermometer with mercury column

NOTE: Check line voltage under load. Low voltage will lower the magnetron output. Make all temperature and time tests with accurate equipment.

1. Fill the one liter glass vessel with water.
2. Stir water in glass vessel with thermometer, and record glass vessel's temperature ("T1", 10±1˚C).
3. After moving the water into another glass vessel, place it in the center of the cooking tray. Set the oven to high power and operate for 48seconds exactly. (1.5 seconds included as a holding time of magnetron oscillation:)
4. When heating is finished, stir the water again with the thermometer and measure the temperature ("T2").
5. Subtract T1 from T2. This will give you the water temperature rise. (ΔT)
6. The output power is obtained by the following formula;

$$\text{Output Power} = \frac{4.187 \times 1000 \times \Delta T + 0.55 \times Mcx(T_2 - T_0)}{46.5}$$

46.5: Heating Time (sec)
4.187 : Coefficient for Water
1000 : Water (cc)
ΔT : Temperature Rise (T2-T1)
Mc : Cylindrical borosilicate glass weight
To : Room temperature.

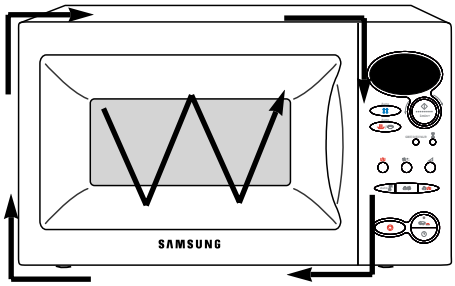
7. Normal temperature rise for this model is 9˚C to 11˚C at 'HIGH'.

NOTE 1: Variations or errors in the test procedure will cause a variance in the temperature rise. Additional power test should be made if temperature rise is marginal.

NOTE 2: Output power in watts is computed by multiplying the temperature rise (step 5) by a factor of 90 times the of centigrade temperature.

5-9 Procedure for Measurement of Microwave Energy Leakage

1) Pour 275±15cc of 20±5˚C(68±9˚F) water in a beaker which is graduated to 600cc, and place the beaker in the center of the oven.
2) Start to operate the oven and measure the leakage by using a microwave energy survey meter.
3) Set survey meter with dual ranges to 2,450MHz.
4) When measuring the leakage, always use the 2 inch spacer cone with the probe. Hold the probe perpendicular to the cabinet door. Place the spacer cone of the probe on the door and/or cabinet door seam and move along the seam, the door viewing window and the exhaust openings moving the probe in a clockwise direction at a rate of 1 inch/sec. If the leakage testing of the cabinet door seam is taken near a corner of the door, keep the probe perpendicular to the areas making sure that the probe end at the base of the cone does not get closer than 5cm to any metal. If it gets closer than 5cm, erroneous readings may result.



5) Measured leakage must be less than 4mW/cm^2, after repair or adjustment.

Maximum allowable leakage is 5mW/cm^2.
4mW/cm^2 is used to allow for measurement and meter accuracy

5-10 Check for Microwave Leakage

1. Remove the outer panel.
2. Pour 275±15cc of 20±5˚C(68±9˚F) water in a beaker which is graduated to 600cc, and place the beaker in the center of the oven.
3. Start the oven at the highest power level.
4. Set survey meter dual ranges to 2,450MHz.
5. Using the survey meter and spacer cone as described above, measure arnear the opening of magnetron, the surface of the air guide and the surface of the wave guide as shown in the following photo.(but avoid the high voltage components.) The neading should be less than 4mW/cm^2.

WARNING
AVOID THE HIGH VOLTAGE COMPONENTS.

5-11 Note on Measurement

1) Do not exceed the limited scale.
2) The test probe must be held on the grip of the handle, otherwise a false reading may result when the operator's hand is between the handle and the probe.
3) When high leakage is suspected, do not move the probe horizontally along the oven surface; this may cause damage to the probe.
4) Follow the recommendation of the manufacturer of the microwave energy survey meter.

5-12 Leakage Measuring Procedure

5-12-1 Record keeping and notification after measurement
1) After adjustment and repair of a radiarion preventing device, make a repair record for the measured values, and keep the data.
2) If the radiation leakage is more than 4 mW/cm^2 after determining that all parts are in good condition, functioning properly and the identical parts are replaced as listed in this manual notift that fact to ;

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5-12-2 At least once a year have the microwave energy survey meter checked for accuracy by its manufacturer.

6. Troubleshooting

PRECAUTION

1. CHECK GROUNDING BEFORE CHECKING FOR TROUBLE.
2. BE CAREFUL OF THE HIGH VOLTAGE CIRCUIT.
3. DISCHARGE THE HIGH VOLTAGE CAPACITOR.
4. WHEN CHECKING THE CONTINUITY OF THE SWITCHES OR TRANSFORMER, DISCONNECT ONE LEAD WIRE FROM THESE PARTS AND THEN CHECK CONTINUITY WITHOUT THE POWER SOURCE ON. TO DO OTHERWISE MAY RESULT IN A FALSE READING OR DAMAGE TO YOUR METER.
5. DO NOT TOUCH ANY PART OF THE CIRCUIT OR THE CONTROL CIRCUIT BOARD, SINCE STATIC DISCHARGE MAY DAMAGE IT. ALWAYS TOUCH GROUND WHILE WORKING ON IT TO DISCHARGE ANY STATIC CHARGE BUILT UP.

6-1 Electrical Malfunction

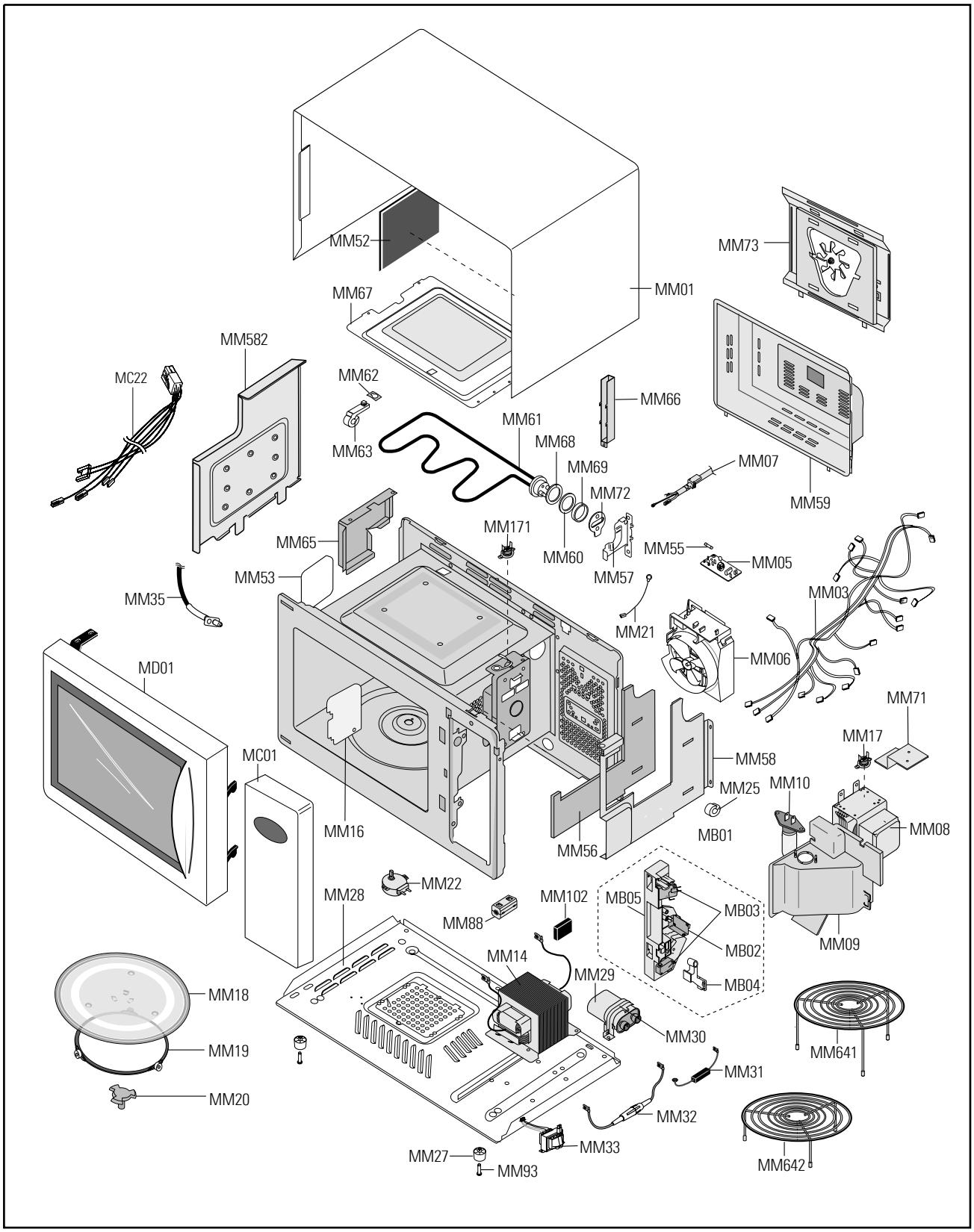
SYMPTOM	CAUSE	CORRECTIONS
Oven is dead. Fuse is OK. No display and no operation at all.	1. Open or loose lead wire harness 2. Open thermal cutout (Magnetron) 3. Open low voltage transformer 4. Defective Ass'y PCB	Check fan motor when thermal cutout is defective. Check Ass'y PCB when LVT is defective.
No display and no operation at all. Fuse is blown.	1. Shorted lead wire harness 2. Defective primary latch switch (NOTE 1) 3. Defective monitor switch (NOTE1) 4. Shorted HVCapacitor 5. Shorted HVTransformer (NOTE2)	Check adjustment of primary, interlock monitor, power relay, door sensing switch.
	NOTE 1: All of these switches must be replaced at the same time. (refer to adjustment instructions) Check continuity of power relay contacts and if it has continuity, replace power relay also. NOTE 2: When HVTransformer is replaced, check diode and magnetron also.	
Oven does not accept key input (Program)	1. Key input is not in-Sequence 2. Open or loose connection of membrane key pad to Ass'y PCB 3. Shorted or open membrane panel 4. Defective Ass'y PCB	Refer to operation procedure. Replace PCB main.
Timer starts countdown but no microwave oscillation. (No heat while oven lamp and fan motor turn on.)	1. Off-alignment of latch switches 2. Open or loose connection of high voltage circuit especially magnetron filament circuit NOTE: Large contact resistance will bring lower magnetron filament voltage and cause magnetron to lower output and/or intermittent oscillation. 3. Defective high voltage components H.V.Transformer H.V.Capacitor H.V.Diode,H.V.Fuse Magnetron 4. Open or loose wiring of power relay 5. Defective primary latch switch 6. Defective power relay or Ass'y PCB	Adjust door and latch switches. Check high voltage component according to component test procedure and replace if it is defective. Replace PCB main.

6-2 Electrical Malfunction(continued)

SYMPTOM	CAUSE	CORRECTIONS
Oven lamp and fan motor turn on	1. Misadjustment or loose wiring of primary latch switch 2. Defective primary latch switch	Adjust door and latch switches.
Oven can program but timer does not start.	1. Open or loose wiring of secondary interlock switch 2. Off-alignment of primary interlock 3. Defective secondary interlock S/W	Adjust door and interlock switches.
Microwave output is low;. Oven takes longer time to cook food.	1. Decrease in power source voltage. 2. Open or loose wiring of magnetron filament circuit. (Intermittent oscillation)) 3. Aging of magnetron	Consult electrician.
Fan motor turns on when plugged in	Loose wiring of door sensing switch	Check wire of door sensing switch.
Oven does not operate and return to the plugged in mode.	Defective Ass'y PCB	Replace PCB main.
Loud buzzing noise can be heard.	1. Loose fan and fan motor 2. Loose screws on H.V.Transformer 3. Shorted H.V.Diode	Tighten screws of fan motor. Tighten screws of H.V.Transformer. Replace H.V.Diode.
Turntable motor does not rotate.	1. Open or loose wiring of turntable motor. 2. Defective turntable motor.	Check the wire of turntable motor Replace turntable motor.
Oven stops operation during cooking	1. Open or loose wiring of primary interlock switch 2. Operation of thermal cutout(Magnetron)	Adjust door and latch switches.
Sparks	1. Metallic ware or cooking dishes touching on the oven wall. 2. Ceramic ware trimmed with gold or silver powder also causes sparks.	Inform the customer. Do not use any type of cookware with metallic trimming.
Uneven cooking	Uneven intensity of microwave due to its characteristics.	Wrap thinner parts of the food with aluminum foil. Use plastic wrap or cover with a lid. Stir once or twice while cooking foods such as soup, cocoa, or milk.
Noise from the turntable motor when it starts to operate.	Noise may result from the motor.	Replace turntable motor.

7. Exploded Views and Parts List

7-1 Exploded Views



7-2 Main Parts List

CK135/XEF

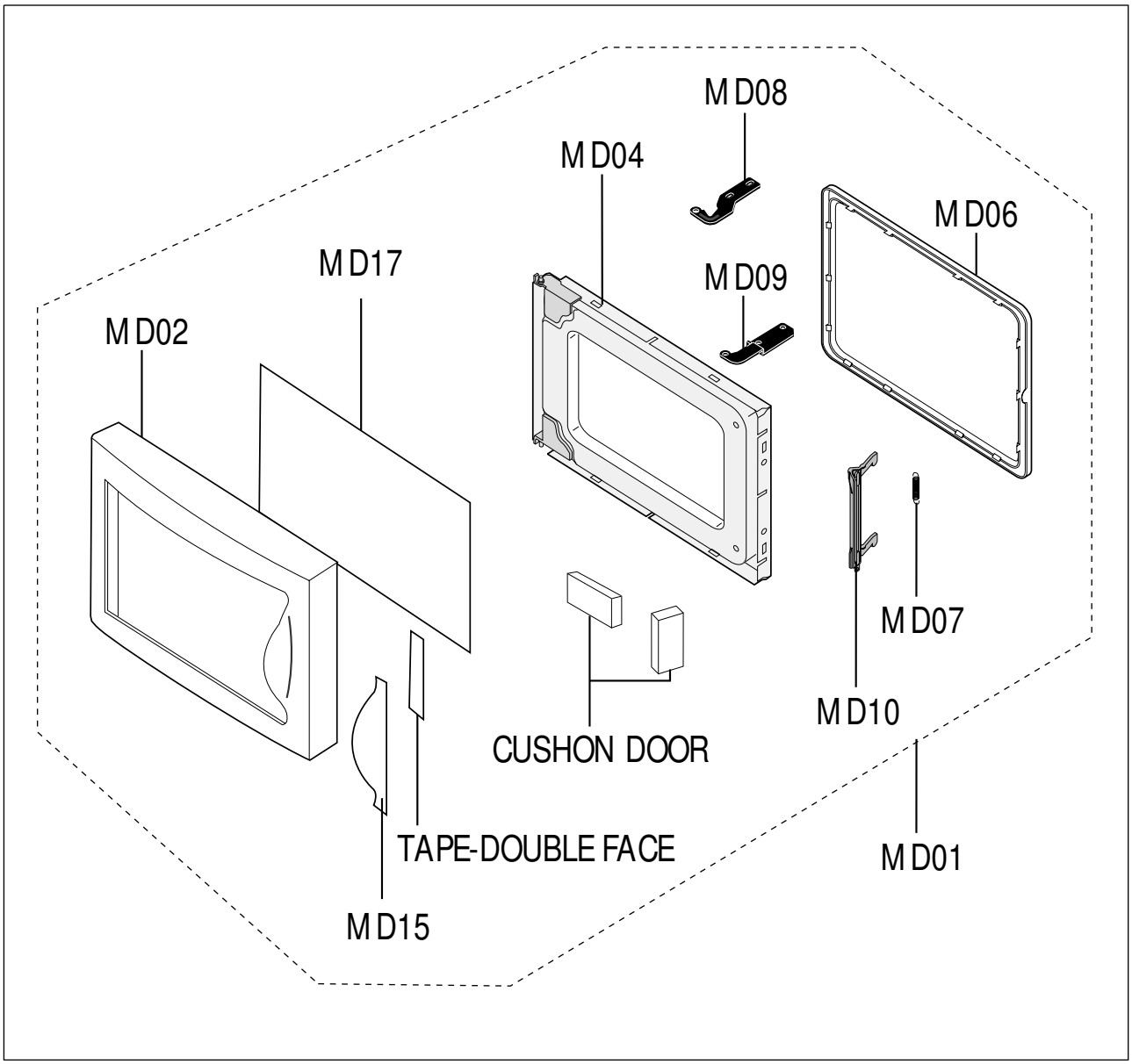
No.	Part Code	Description	Specification	Q'ty	Remark
MB01	DE93-20020D	ASSY BODY LATCH	M959/XSA,-,-,-,-	1	-
MB02	3405-000175	SWITCH-MICRO	250V,15A,200gf,SPST-NO	1	-
MB03	3405-000178	SWITCH-MICRO	250V,15A,200gf,SPST-NO	2	-
MB04	DE66-90054B	LEVER-SWITCH	NYLON#66(2021SW),40G,M959/XSA,	1	-
MB05	DE66-40021B	LATCH-BODY	NYLON#66(2021SW),40g,M959/XSA,	1	-
MM01	DE70-30002W	PANEL-OUTER	PCM,T0.6,-,-,P-WHT,CK135,-	1	-
MM03	DE39-00173A	WIRE HARNESS-A	230V50Hz,CK135,-,-,-,-,-,-,-,-,-,-	1	-
MM05	DE96-00011C	ASSY NOISE FILTER	SN-3WED,250V10A,3W NO-INRUSH TC,-,-,-,-	1	-
MM06	DE31-00001D	MOTOR-FAN	-,SMF-2D3EA,230V50Hz,-,M1D33CE/XSA.RAD,-	1	-
MM07	DE39-00022B	ASSY POWER CORD	4819D,CK135,230V50Hz,-,-,-,-,-	1	-
MM08	OM75PH(31)ESS	ASSY-MAGNETRON	OM75PH(31)ESS	1	-
MM09	DE71-00062A	COVER-AIR	NYLON#66,-,-,-,-,CK135T,1.3-CONV	1	-
MM10	4713-001046	LAMP-INCANDESCENT	240V,104mA,25W,ORG,-,-,25x62mm	1	-
MM102	DE63-00023A	CUSHION-HVT	-,EPDM,T25.5,W30,L50,-,CK135,HS75	1	-
MM14	DE26-00008A	TRANS-H.V	SHV-293EC,230V50HZ,2230V/3.15V,-,DY	1	-
MM16	DE71-60461A	COVER-CEILING	MICA,T0.3,W114.2,L117.5,-,3RD-	1	-
MM17	DE47-20009A	THERMOSTAT	PW2N-520PB,160/60,250V/7.5A,H,	1	CAVITY-U
MM171	DE47-20009A	THERMOSTAT	PW2N-520PB,160/60,250V/7.5A,H,	1	-
MM18	DE74-20002A	TRAY-COOKING	GLASS,T6,PI360,1.2CUFT,NEG,-,-	1	-
MM19	DE92-90189B	ASSY-GUIDE ROLLER	D16.5,STD,-,-,-,-	1	-
MM20	DE67-60082A	COUPLER	PPS,T5.3XL24.1,-,BRN,3RD-W(1.3),MW7896W,-	1	-
MM21	DE39-40409A	WIRE HARNESS-E	230V50HZ,M9G45,CTW,-,-,-	1	-
MM22	DE31-10170A	MOTOR-SYNCHRONOUS	M2LJ24Z702,ST-16F,220/240V,2.5	1	-
MM25	DE65-20014A	CABLE CLAMP	DA-6N,NY-66,-,-,-,-,-,-	1	P-CORD
MM27	DE61-40065A	FOOT	PP,BLK,T2x22x17mm,-,-,-	4	-
MM28	DE80-10002G	BASE-PLATE	SGCC,T0.8,W404,L633,CK135,-	1	-
MM29	2501-001107	C-OIL	1.1uF,2.1KV,BK,54x35x85,20mm	1	-
MM30	DE61-50106A	BRACKET-HVC	SECC,T0.8,W31,L125.8,-,-,-	1	-
MM31	DE59-40001A	DIODE-H.V	HVR-1X-32B-12,-,-,-,-,-	1	-
MM32	DE91-70061A	ASSY-H.V.FUSE	THV060T-0800-H,5KV/0.80A,WHT	1	-
MM33	DE26-20152A	TRANS-L.V	SLV-105E,230V,50HZ,AC17V/3V,-,	1	-
MM35	DE32-10013A	SENSOR-THERMISTOR	PT-312-K2,-,-,-,-,-,-	1	-
MM52	DE63-90035I	CUSHION-RUBBER	DFA20,T1.5,W190,L100,BLK,JE154	1	OUTER-P
MM53	DE64-00131A	FILM-LAMP	PET,W74xL105,T0.11,CK135,-	1	-
MM55	3601-000448	FUSE-CARTRIDGE	250V,10A,SLOW-BLOW,CERAMIC,6.35x31.8mm	1	-
MM56	DE62-00009A	ADIABATIC-RIGHT	T3.0,W173.5,L247,CK135,SUPER FINE INSULA	1	-
MM57	DE61-50027B	BRACKET-HEATER	SECC,T1.0,W51,L55,CE945GF,-,-	1	-
MM58	DE62-90099A	ADIABATIC-COVER	T15,W290,L377,CE115K,-,-,-,-	1	-
MM581	DE71-00066A	COVER-ADIABATIC-R	SECC,T0.6,-,-,-,CK135T,1.3-CONV	1	-
MM59	DE71-60386A	COVER-BACK	SCP3,T0.6,W275,L385.5,BLK-COAT	1	-
MM60	DE63-20017A	GASKET-HEATER	BRASS,T1.5,OD30.5,ID22.5,-,-,-	1	-
MM61	DE47-70031G	HEATER-GRILL	D6.6,230V1280W,M9G45,SJH,-,-,-	1	-
MM62	DE61-70060A	SPRING-PLATE	SK-5,T0.5,-,-,-,-,-	1	-
MM63	DE61-30006A	SUPPORTER-HEATER	ALUMINA,5G,2ND-W/P,-,-,-,-	1	-
MM641	DE97-00136D	ASSY-WIRE RACK	CK135,HIGH-RACK,-,-	1	-
MM642	DE97-00136C	ASSY-WIRE RACK	CK95,LOW-RACK,-,-,-,-	1	-

7-2 Main Parts List

CK135/XEF

No.	Part Code	Description	Specification	Q'ty	Remark
MM65	DE72-60035R	GUIDE-AIR	SECC,T0.5,-,-,-,CK135,-	1	-
MM66	DE61-50570B	BRACKET-AIR GUIDE	SECC T0.8,CK95,-	2	-
MM67	DE61-00068A	BRACKET-UPPER	SECC,T0.6,-,-,-,CK135T,-	1	-
MM68	DE60-40009B	WASHER-TEFLON	SLOT,ID22.2,OD28,T1.2,TEFLON,-	1	-
MM69	DE61-50021A	BRACKET-FLANGE	SECC1,T0.8,32,32,-,-,-	1	-
MM71	DE61-50490A	BRACKET-TCO	SECC1,T0.6,34,58,-,-,-	1	-
MM72	DE61-50347A	BRACKET-EARTH	BSS2-A,T1.0,W35,L43,MBGF45,-,-	1	-
MM88	DE73-90027A	FERRITE-CORE	NI-ZN,T13.8,W21.0,L28.0,BNF-14	1	-
MM93	DE60-60025A	PIN-FOOT	PP-JI350,BLK,-,-,-,-,-,-	4	-
MC22	DE39-00174A	WIRE HARNESS-B	230V50Hz,CK135,-,-,-	1	-

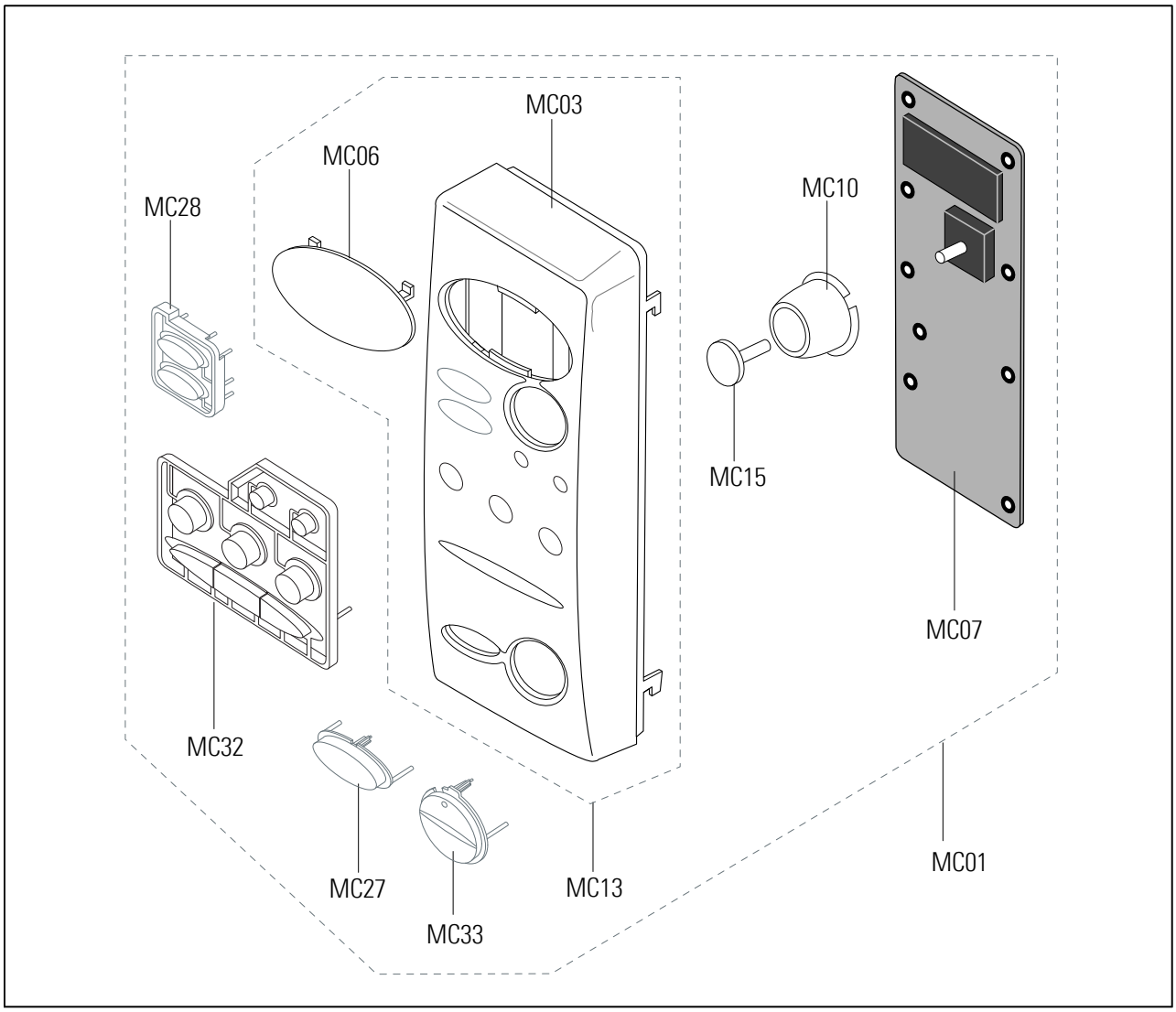
7-3 Door Parts List



CK135/XEF

No.	Part Code	Description	Specification	Q'ty	Remark
MD01	DE94-00298A	ASSY DOOR	CK135T,P/WHT,1.3 CONVECTION	1	-
MD02	DE64-00084A	DOOR-A	PC(141R),-,-,-,WHT(80409),CE135T,-,-,-	1	-
MD04	DE94-00300A	ASSY DOOR-E	CK135T,BLK,SEALING	1	-
MD06	DE64-00087A	DOOR-C	PBT,-,-,-,1.3-CONV,CK135T,-,-,BLK	1	-
MD07	DE61-00103A	SPRING-KEY	CK135,HSWR,D6.0,-,L32.8,27 3/4,-,T0.8,BLUING	1	-
MD08	DE61-80002A	HINGE-UPPER	SCP1,T2.3,26,77,ZPC3,WHT,CE945	1	-
MD09	DE61-80003A	HINGE-LOWER	SCP1,T2.3,26,77,ZPC3,WHT,CE945	1	-
MD10	DE64-40264B	DOOR-KEY	NYLON#66(2021SW),40G,-,M959/XS	1	-
MD15	DE64-00085A	DECORATION-DOOR	PC(141R),-,-,-,-,WHT(80409),-,CK135T,-,-,-	1	-
MD17	DE67-00061B	SCREEN-DOOR(B)	CK138F/XEF,GLASS,-,W260.5,L422.5,-,-	1	-

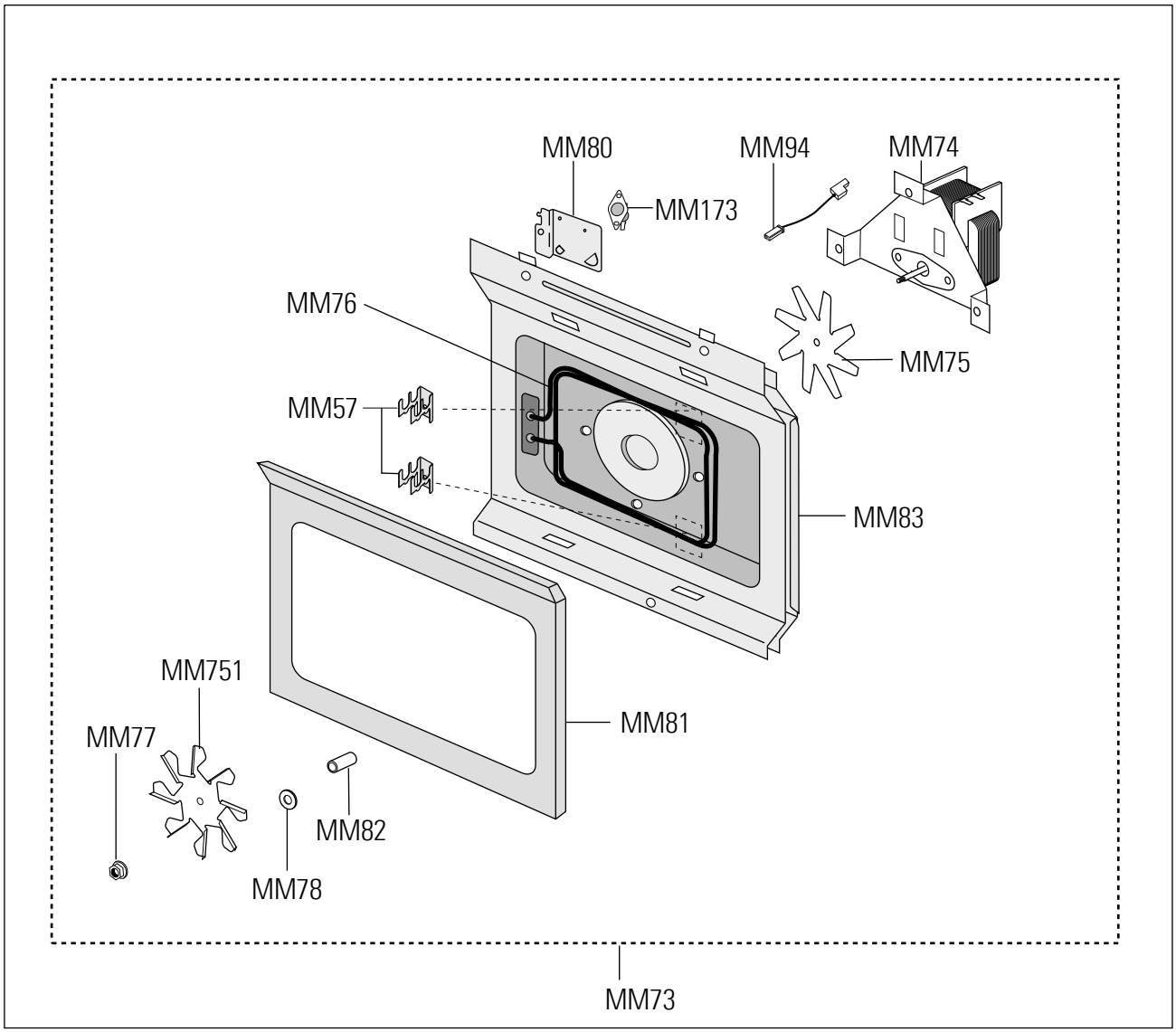
7-4 Control Parts List



CK135/XEF

No.	Part Code	Description	Specification	Q'ty	Remark
MC01	DE94-00299A	ASSY CONTROL-BOX	-,CK135T,P/WHT,1.3 CONVECTION	1	-
MC03	DE72-00078A	CONTROL-PANEL	PC(141R),CK135T,-,-,-,-,WHT(80409),-	1	-
MC06	DE67-00045A	WINDOW-DISPLAY	SAN,T2,W69.6,-,SMOG,CK135T,-	1	-
MC07	RC-135T-00	ASSY PCB PARTS:CK135		1	-
MC10	DE64-00123A	KNOB-COVER	-,-,-,CK135T,-,-,-,CONVECTION,-	1	-
MC13	DE94-00318A	ASSY CONTROL-PANEL	-,CK135,P/WHT,-	1	-
MC15	DE67-00060A	BUTTON-START	-,-,WHT,CK135T,-,-	1	-
MC27	DE67-00055A	BUTTON-CANCEL	P.C CLEAR,-,-,-,CK135T,-,-,-	1	-
MC28	DE67-00047A	BUTTON-DEFROST	PC(141R),-,-,WHT(80409),CK135T,-,-,-	1	-
MC32	DE97-00137A	ASSY-BUTTON SELECT	CK135T,P/WHT,-,-,-,-	1	-
MC33	DE97-00139A	ASSY-BUTTON CLOCK	CK135T,P/WHT,-,-,-,-	1	-

7-5 Casing Parts List



CK135/XEF

No.	Part Code	Description	Specification	Q'ty	Remark
MM100	DE60-40014B	WASHER-C MOTOR	M16,T1.0,SECC,ZNC3,-,-,-,-,-	1	-
MM173	DE47-20009A	THERMOSTAT	PW2N-520PB,160/60,250V/7.5A,H,	1	-
MM73	DE92-90478K	ASSY-CASING	CK135T,COVER-CASING,-,-,-,-	1	-
MM74	DE31-10171A	MOTOR-CONVECTION	SMC-105EA,230V/50HZ,2800RPM,-,	1	-
MM75	DE31-90019A	BLADE-FAN	SECC,T0.6,-,-,-,-,-	1	-
MM751	DE31-90020A	BLADE-FAN	ALSTAR,T0.6,W250,L250,-,-,-	1	-
MM76	DE47-70077A	HEATER-CONVECTION	230V,1680W,30.7,7,-,-,-,-,-	1	-
MM77	DE60-30016B	NUT-FLANGE	M4,MSWR10,FEFN,-,-,-,-,-,-	1	-
MM78	DE60-40026A	WASHER-PLAIN	ID5.5,OD12,T1.0,SBC1,-,-,-,-,-	1	-
MM81	DE62-00008A	ADIABATIC-CASING	T3.0,W241,L336.8,CK135,SUPER FINE INSULATIC	1	-
MM82	DE72-30016B	BUSH-MOTOR	MSWR3,D5.6,L15.7,CE115K,ZP3,-,	1	-
MM83	DE92-90487A	ASSY-COVER CASING	CE115K,230V50HZ,-,-,-,-	1	-

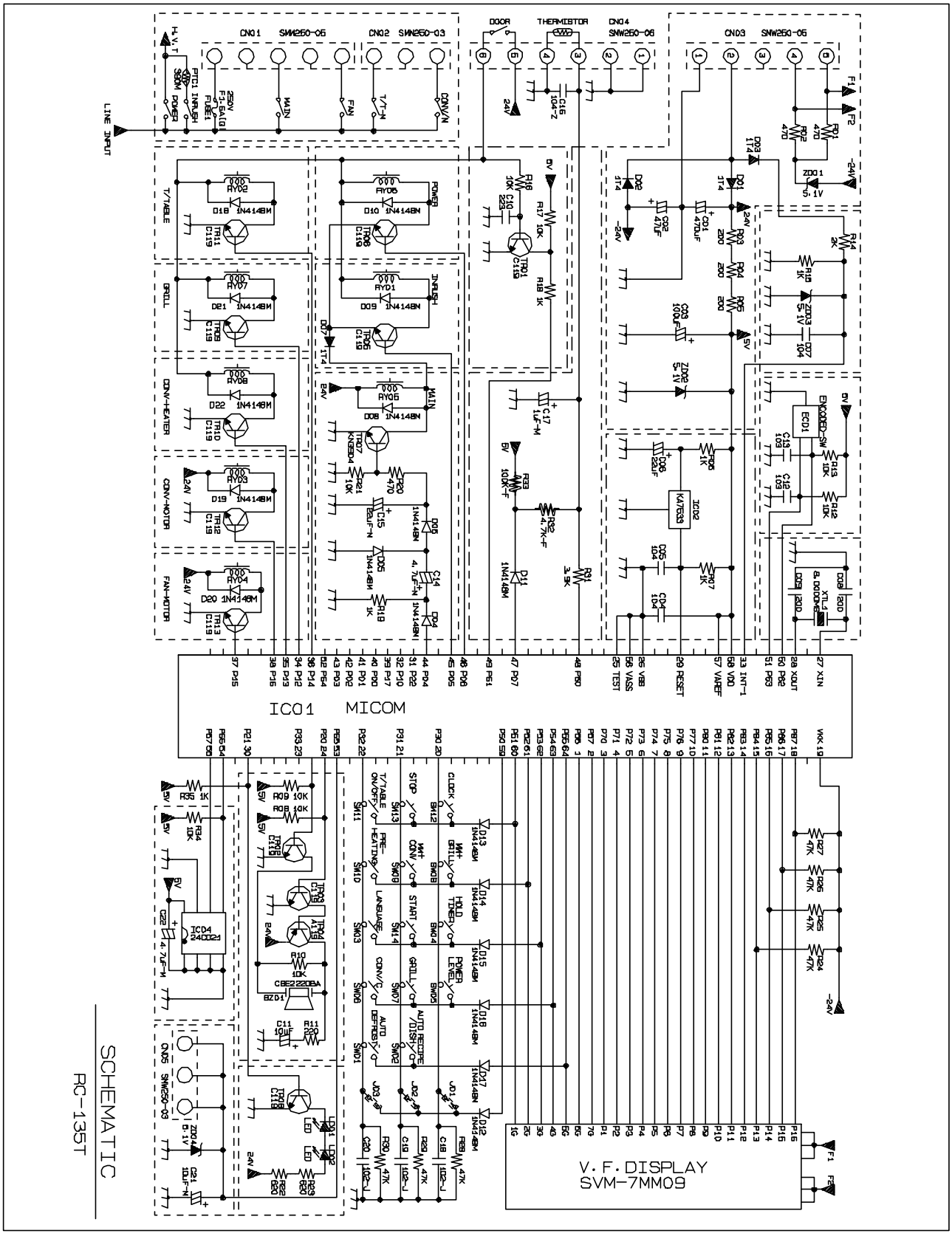
7-6 Standard Parts List

CK135/XEF

Part Code	Description	Specification	Q'ty	Remark
DE60-10012A	SCREW-TAP TITE	TH,+,3,M4,L10,SWR10,ZPC2,TOOTH	1	N-F-EA
DE60-10012A	SCREW-TAP TITE	TH,+,3,M4,L10,SWR10,ZPC2,TOOTH	1	P-C-EA
DE60-10012A	SCREW-TAP TITE	TH,+,3,M4,L10,SWR10,ZPC2,TOOTH	1	S-M-EA
DE60-10018A	SCREW-ASSY MACHINE	PH,M4X0.7P,8,MSWR10,SN1,WS,-,-	2	B/EATH
DE60-10034A	SCREW-TH	TH,+,M4,L10,STS304,-,-,-,-,-	1	SENSOR
DE60-10045A	SCREW-TAP PH	PH,M3,L6,FEFZY,-,-,-,-,-	1	MG-TCO
DE60-10080B	SCREW-WASHER	PH,PI5,L10,SWRCH18A,ZP2,2S,-,-	4	MGT
DE60-10080B	SCREW-WASHER	PH,PI5,L10,SWRCH18A,ZP2,2S,-,-	4	TNS-HV
DE60-10082H	SCREW-A	2S-4X12,TOOTHED,-,-,-,-,-,-,-	5	B-PLTE
DE60-10082H	SCREW-A	2S-4X12,TOOTHED,-,-,-,-,-,-,-	1	BKT/AIR
DE60-10082H	SCREW-A	2S-4X12,TOOTHED,-,-,-,-,-,-,-	3	BKT/UP
DE60-10082H	SCREW-A	2S-4X12,TOOTHED,-,-,-,-,-,-,-	1	C/AIR
DE60-10082H	SCREW-A	2S-4X12,TOOTHED,-,-,-,-,-,-,-	2	C/BLOW
DE60-10082H	SCREW-A	2S-4X12,TOOTHED,-,-,-,-,-,-,-	2	C/CASING
DE60-10082H	SCREW-A	2S-4X12,TOOTHED,-,-,-,-,-,-,-	1	CN-BOX
DE60-10082H	SCREW-A	2S-4X12,TOOTHED,-,-,-,-,-,-,-	2	CO-A/RIG
DE60-10082H	SCREW-A	2S-4X12,TOOTHED,-,-,-,-,-,-,-	2	CV/BACK
DE60-10082H	SCREW-A	2S-4X12,TOOTHED,-,-,-,-,-,-,-	2	GRILL/TCO
DE60-10082H	SCREW-A	2S-4X12,TOOTHED,-,-,-,-,-,-,-	1	GUIDE-AI
DE60-10082H	SCREW-A	2S-4X12,TOOTHED,-,-,-,-,-,-,-	2	LATCH
DE60-10082H	SCREW-A	2S-4X12,TOOTHED,-,-,-,-,-,-,-	5	PN-OUT
DE60-10098A	SCREW-ASSY TAP TITE	PH,TC,M4X8,SWRCH18A,ZPC2,GLD,W	2	M/DRIV
DE60-10122A	SCREW-TAP TH	TAP,TH,2-4X8,FE,FN,-,-,-,-,-	2	BKT/HEA
DE60-10122A	SCREW-TAP TH	TAP,TH,2-4X8,FE,FN,-,-,-,-,-	1	C-CEIL
DE60-20063A	BOLT-FLANGE	M4,10,ZPC3,YEL,MSWR,-,-,-,-	2	HI-LOW
DE60-20063A	BOLT-FLANGE	M4,10,ZPC3,YEL,MSWR,-,-,-,-	2	HI-UPP
DE60-30016A	NUT-FLANGE	M4,MSWR10,-,-,-,-,-,-,-	1	SENSOR
DE60-10045A	SCREW-TAP PH	PH,M3,L6,FEFZY,-,-,-,-,-,-	1	-
DE60-10061A	SCREW-TAP TH	TH,M4,L8,STS,-,-,-,-,-,-	3	B/MORT
DE60-10122A	SCREW-TAP TH	TAP,TH,2-4X8,FE,FN,-,-,-,-,-	2	SUPP-HEA
DE60-10045A	SCREW-TAP PH	PH,M3,L6,FEFZY,-,-,-,-,-,-	1	-
DE60-10122A	SCREW-TAP TH	TAP,TH,2-4X8,FE,FN,-,-,-,-,-	4	CV-CAS
DE60-10088A	SCREW-TAP PH	PH,M3,L8,FEFZY,PLAIN,-,-,-,-,-	8	ASSY-PCB
DE60-10082H	SCREW-A	2S-4X12,TOOTHED,-,-,-,-,-,-,-	2	LVT
DE60-10098A	SCREW-ASSY TAP TITE	PH,TC,M4X8,SWRCH18A,ZPC2,GLD,W	1	HVD
DE60-10012A	SCREW-TAP TITE	TH,+,3,M4,L10,SWR10,ZPC2,TOOTH	1	-

8. P.C.B Diagrams

8-1 P.C.B Diagrams



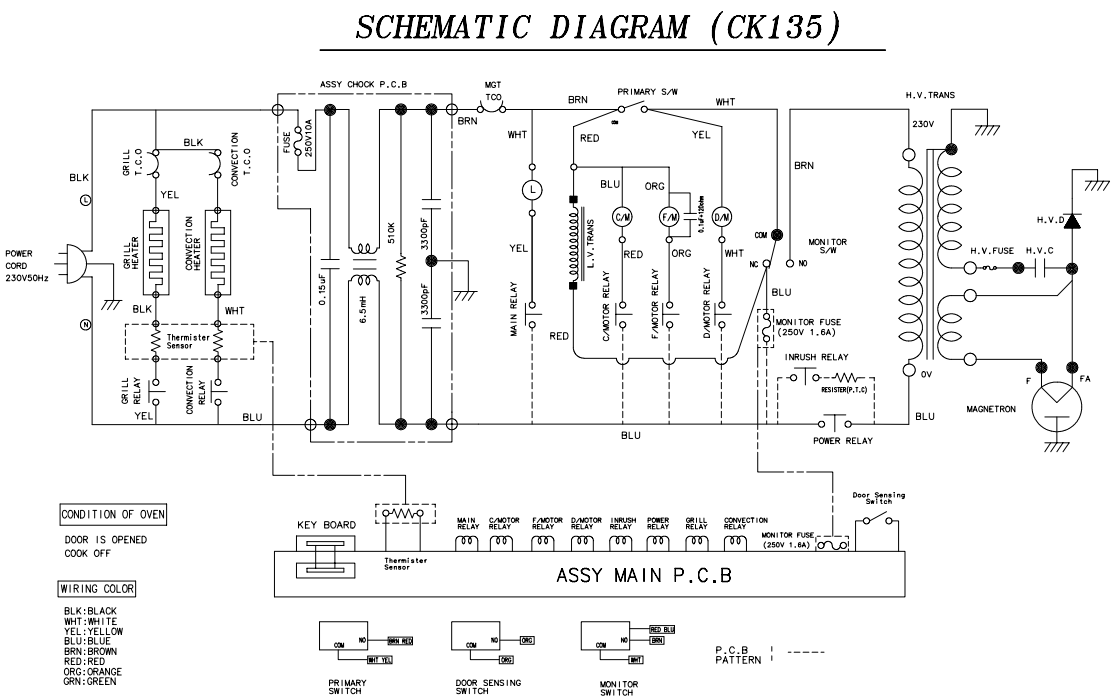
8-2 P.C.B Parts List

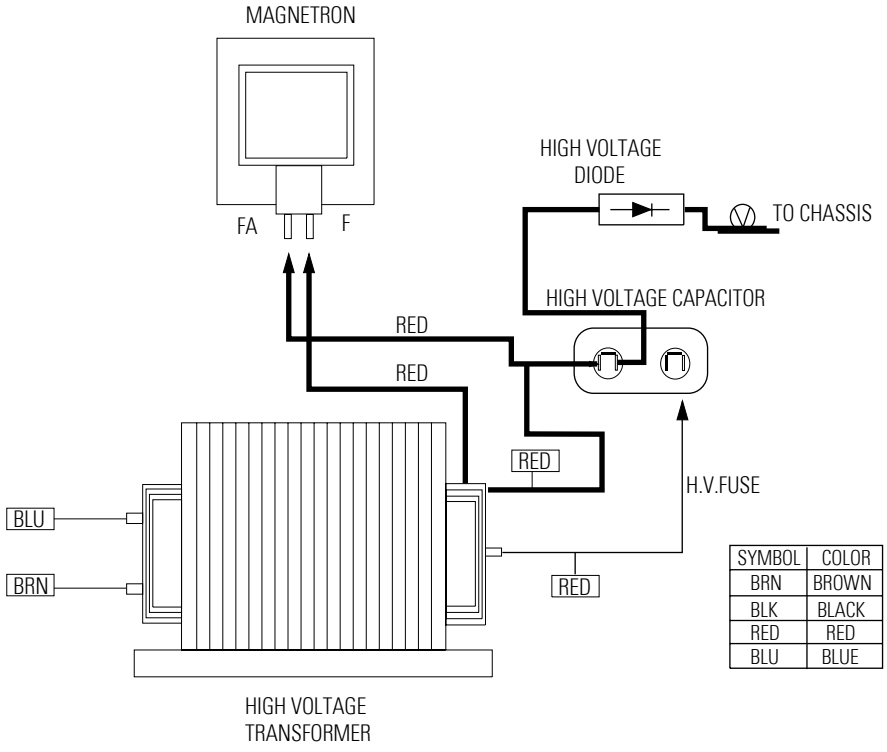
CK135/XEF

Part Code	Description	Specification	Q'ty	Remark
0201-000280	ADHESIVE-TS	SA-33P-2,RED,950+-110(PS)	0	-
3501-001062	RELAY-POWER	24VDC,523.2mW,16A,1FormA,15mS,	1	RY06
3501-001068	RELAY-POWER	24Vdc,523mW,16A,1FormA,15mS,10	2	RY07,08
3501-001155	RELAY-MINIATURE	24VDC,200MW,3000MA,1FORMA,10MS,10MS	5	RY01~05
3601-001126	FUSE-CARTRIDGE	250V,1.6A,FAST-ACTING,CERAMIC,5x20mm	1	FUSE1
DE07-10096A	V.F.DISPLAY	SVM-07MM09,GRN/ORG,7DIG,112seg	1	VFD1
DE09-00108A	IC-MCU	TMP87PM14F,OTP-32K,QFP,8BIT-64PIN,-,-,-	1	IC01
DE30-20016A	BUZZER	CBE2220BA,STICK,-,-,-,-,-,-,-	1	BUZ1
DE34-00063A	SWITCH-PRESSURE	DAIL,28VDC,10mA,24,-,JES1424GS	1	ECD1
DE47-40024A	HOLDER-FUSE	FH-51H,7.5A,-,-,-,-,-	1	FUSE1
DE61-90048D	HOLDER-DIGITRON	NYLON#66,10G,BLK,-,-,-,-,-,-	1	-
DE92-00469A	ASSY PCB AUTO	230V50Hz,VFD,RC-135T-00,CK135T	1	-
0401-001083	DIODE-SWITCHING	MM4148,100V,150MA,LL-34,TP	18	D04~06,08~22
0402-001103	DIODE-RECTIFIER	1T4,400V,1A,TS-1,TP	4	D01,02,03,07
0403-001288	DIODE-ZENER	ZMM55C5V1,4.8-5.4V,500MW,LL-34,TP	3	ZD01,02,03
0501-000465	TR-SMALL SIGNAL	MMBT3904,NPN,225mW,SOT-23,TP,3	1	TR07
0504-000130	TR-DIGITAL	KSR1105TF,NPN,200MW,4.7K/10K,SOT-23,T	11	TR01~03,05,06,08~13
0504-000159	TR-DIGITAL	KSR2105,PNP,200MW,4.7K/10K,SOT-23,TP	1	TR04
0601-001467	LED	CHIP,RED,1.4x1.25mm,640nm	1	LD01,02
1202-000141	IC-VOLTAGE COMP.	7033,SOT-89,3P,-,SINGLE,0V,-,P	1	IC02
1404-001194	THERMISTOR-PTC	39ohm,20%,220/240V,270Vac,1.2A,-,TP	1	PTC1
2001-001102	R-CARBON(S)	200OHM,5%,1/2W,AA,TP,2.4X6.4MM	3	R03,04,05
2001-003132	R-CARBON(S)	620ohm,5%,1/2W,AA,TP(26mm),2.4	2	R22,23
2007-000277	R-CHIP	100KOHM,1%,1/10W,DA,TP,2012	1	R33
2007-000300	R-CHIP	10KOHM,5%,1/10W,DA,TP,2012	8	R08~10,12,13,16,17
2007-000468	R-CHIP	1KOHM,5%,1/10W,DA,TP,2012	7	R06,07,15,18,19,31,35
2007-000572	R-CHIP	220OHM,5%,1/10W,DA,TP,2012	1	R11
2007-000671	R-CHIP	2KOHM,5%,1/10W,DA,TP,2012	1	R14
2007-000868	R-CHIP	4.7KOHM,1%,1/10W,DA,TP,2012	1	R32
2007-000931	R-CHIP	470OHM,5%,1/10W,DA,TP,2012	3	R01,02,20
2007-000941	R-CHIP	47KOHM,5%,1/10W,DA,TP,2012	7	R24~30
2203-000260	C-CERAMIC,CHIP	10nF,10%,50V,X7R,TP,2012	2	C12,13
2203-000444	C-CERAMIC,CHIP	1nF,10%,50V,X7R,TP,2012,-	3	C18,19,20
2203-000555	C-CERAMIC,CHIP	0.02nF,5%,50V,NP0,TP,2012	2	C08,09
2203-001608	C-CERAMIC,CHIP	22nF,+80-20%,50V,Y5V,TP,2012	5	C04,05,07,10,16
2401-000244	C-AL	100uF,20%,10V,GP,TP,6.3x7,5	1	C03
2401-000466	C-AL	10uF,20%,35V,GP,TP,5x7,5	1	C11
2401-000598	C-AL	1uF,20%,50V,GP,TP,4x7,5	1	C17
2401-000911	C-AL	22uF,20%,16V,GP,TP,5x7,5	2	C06,15
2401-002075	C-AL	4.7uF,20%,50V,GP,TP,5x11,5	1	C14
2401-002438	C-AL	47uF,20%,50V,WT,TP,6.3x11,5	1	C02
2401-002598	C-AL	220uF,20%,50V,GP,TP,10x16,5	1	C01
2801-003933	CRYSTAL-UNIT	8MHz,50ppm,28-AAA,12pF,70ohm,TP	1	XTL1
3404-001129	SWITCH-TACT	12VDC,50mA,160gf,6.6x6.6x7mm,-	14	SW01~14
3711-000999	CONNECTOR-HEADER	BOX,5P,1R,2.5mm,STRAIGHT,SN	1	CN03
3711-001038	CONNECTOR-HEADER	BOX,6P,1R,2.5mm,STRAIGHT,SN	1	CN04
3711-004142	CONNECTOR-HEADER	BOX,3P/5P,1R,5mm/2.5mm,STRAIGH	1	CN01
3711-004143	CONNECTOR-HEADER	BOX,2P/3P,1R,5mm/2.5mm,STRAIGH	1	CN02
DE39-60001A	WIRE-SO COPPER	PI0.6,SN,T,52MM,TAPING_WIRE,-,	45	J04~10,12~49
DE41-00131A	P.C.B-MAIN	RC-135T-**,FR-1,-,-,-,T1.6*90*262,-,-,-,-	1	-

9. Schematic Diagrams

9-1 Schematic Diagrams





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